DIFFUSION, RAG STOP-LOSS & WIND-DRAG CHEAT SHEET

Norms Studio Equipment
Hollywood, California, USA · Est. 1962
Live Wind Ballast Math: /rigging-calculators

1. CINEMA TEXTILE PHOTOMETRIC LOSS (ΔEV) & DRAG COEFFICIENT (CD)

TEXTILE	OPTICAL FUNCTION	LIGHT LOSS / RETURN	WIND DRAG (CD)	AUDIO PROFILE	STAGE NFPA 701
Full Silent Grid Cloth	Pure even wrap	**−1.40 stops**	High (Cd ≈ 1.20)	Silent (zero snap)	Yes (IFR)
1/2 Silent Grid Cloth	Medium soft diffusion	**−0.86 stops**	High (Cd ≈ 1.15)	Silent	Yes (IFR)
1/4 Silent Grid Cloth	Subtle contrast softening	**−0.47 stops**	High (Cd ≈ 1.10)	Silent	Yes (IFR)
Full Poly Silk	Classic specular + wrap	**−1.25 stops**	Med (Cd ≈ 0.85)	Low whisper	Yes (IFR)
1/4 Poly Silk	Mild exterior sun control	**−0.41 stops**	Low (Cd ≈ 0.45)	Silent in wind	Yes (IFR)
Bleached Muslin	Matte organic white softness	**−1.84 stops**	Very High (Cd ≈ 1.30)	Silent cotton	Yes (FR)
Unbleached Muslin	Warm tungsten skin bounce	**−2.47 stops**	Very High (Cd ≈ 1.35)	Silent cotton	Yes (FR)
UltraBounce (W/B)	Soft matte bounce / negative	**+95% Bounce**	Solid (Cd ≈ 1.45)	Quiet waterproof	Yes (IFR)
16oz Commando Cloth	Deep shadow negative fill	**−100% Block**	Solid (Cd ≈ 1.40)	Sound deadening	Yes (FR)
Single Black Net (Green)	Intensity cut, zero color shift	**−0.55 stops**	Ultra-Low (Cd ≈ 0.20)	Silent wind bleed	Yes (FR)
Double Black Net (Red)	Strong cut, retains sharp sun	**−1.15 stops**	Ultra-Low (Cd ≈ 0.35)	Silent wind bleed	Yes (FR)

2. WIND FORCE & BALLAST RULES

Wind Drag Formula: $F_{wind} = \frac{1}{2} \cdot \rho \cdot v^2 \cdot Cd \cdot A$

- **Velocity Squared:** Doubling wind (10 → 20 mph) multiplies frame overturning push by **4×**.
- **Height Amplification:** Gusts at 25 ft carry up to **+48% more dynamic pressure** than ground level.
- **Porous Wind Shedding:** Single/Double Nets bleed wind (60–80% less drag than Solid UltraBounce/Commando).
- **Ballast Margin:** Keep restoring counterweight at **1.5×–3.0×** overturning moment + guy-wires & stakes above 10 mph.
- **Strike Threshold:** Vent or strike solid 12×12 and 20×20 sails approaching **20–28 mph** gusts.

3. FRAME HARDWARE & NFPA 701 FIRE RATINGS

- **6×6 & 8×8 Butterflies:** 3/4" or 1" square aluminum ear-frames on Double-Riser Steel Combo Stands.
- **12×12 & 20×20 Overheads:** 1-1/4" or 1-1/2" Speed-Rail or heavy square frames on 3-Riser High Rollers (1-1/8" Junior Ear) + guy lines.
- **Stainless Shot vs. Silica Sand:** 304/316 shotbags have ~3× bulk density (4.84 vs 1.60 g/cm³) — 66.7% smaller footprint with zero lead dust.
- **IFR (Inherent Flame Retardant):** Silent Grid, Poly Silk, UltraBounce retain flame resistance after rain/washing.
- **FR (Topical Treatment):** Muslin, Commando, Duvetyne lose salt-bath fire rating if rained on or washed — must re-certify.